SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1684.—Vol. XXXVII. LONDON, SATURDAY, NOVEMBER 30, 1867. {STAMPED .. SIXPENCE. UNSTAMPED. FIVEPENCE.

MINING EPISODES IN INDIA.—No. I.

By George Henwood, Mining Engineer.

A VISIT TO THE TAJ, OR MAUSOLEUM, AT AGRA.

This "wonder of the world," as it justly said to be, has been frequently described, and the dimensions given, by parties conversant with architectural terms and details, but never having had the good fortune to have seen one of the publications, I shall not be able to give particulars so minutely and correctly as I could have desired, especially as my visit was of necessity brief; but I am exceedingly glad it has been my good fortune to have seen it at all.

This magnificent building is said to have been erected by Aurengzebe, a Persian monarch, as a mausoleum for the remains of his favourite wife: there are a variety of traditions, of which this seems to be the best authenticated. If this be the true one he must, indeed, have been uxorious; perhaps he was the "model husband," the supposed myth—a race I fear now nearly extinct; at all events, we have not since seen any who have spent three millions of money in raising a monument to display and express the intensity of his affection whilst living and grief at her death. It is not recorded, I believe, nor does tradition inform us, whether or not he married again; perhaps, after all, he was a silly old man. But there is an old English maxim—"One word for my friend, two for myself"—that has more to do with the motive than at first sight appears. I am sceptic enough to suspect this is the real state of the case; over-delicacy has, to my view, been overdone; the tinsel of mock-modesty is too transparent. To me this question presented himself—Did not this monarch in his heart desire, under the guise of love and respect, to build for himself also a magnificent "last resting-place," to be an everlasting witness and record of his extreme virtue, wealth, and power combined? I may have misconstrued his ideas, but I judge from my experience of human nature, and am generally pretty nearly correct. Were these his real views, the architect I hold to be infinitely superior to his employer; if I am wrong, the king was infinitely superior to most princes or men of the past or present day.

The building is a vast pile, executed in white marble and red and variegated sandstone (not, as stated in a recent publication by Mr. M'Kenzie, of Glasgow, yellow marble, there being scarcely a stone of that kind in the entire building), most exquisitely wrought in the minutest detail, every possible space admitting of ornamentation being elaborated to a degree unequalled; yet, strange to say, not an appearance of frittering or littleness presents itself—from whatever point it be viewed or studied the effect is truly grand. The mausoleum itself is surrounded by courts, small mosques, or temples, and household accommodation for hosts of priests and attendants, which are built wholly of the sandstone. The entrance is by a noble arched gate, from which a street of attendants' apartments, highly wrought with pillars, carved bosses, trusses, caryatides, &c., leads to the approach to the "sacred fane," which is through a grand arch of red sandstone, with a domed roof springing from the four angles; in this roof is worked, in relief, a geometrical pattern of double stars, or rather stars interlaced, each such double star communicating by rays with the others, so forming an interminable and endless pattern. The dome, I presume, is meant to symbolise the heavens, the interminable pattern eternity, and the double stars the devoted lovers; if so, it is a beautiful conceit, worthy the designer as much in idea as in execution. This work one would have supposed sufficient to immortalise the architect; but how fleeting is mere fame!—not only is his name lost in oblivion, but his very country is a matter of controversy. Before the visitor enters, his attention is sure to be rivetted to the façade, on which are blocks of pure white marble, into which are mosaiced chapters of the Koran, and prayers of the Faithful. These mosaics are in black marble; the language being Persian—the characters of which are the briefest and most picturesque yet known—there is no formality of lines or stiffness in delineation in the lines and spaces; around are beautifully designed arabesque scrolls of flowers and fruits; but all grotesque and human figures are avoided. The fruits and flowers are composed of marbles and porphyries of the true colours of the objects represented; a marvellous work of itself considering the large proportions of the tableaux, and would suffice to excite surprise were not the impression dispelled by the inspection of the interior.

Passing under the dome, the visitor should turn round to admire the façade inside, which is quite equal to that before seen. A flight of steps in red sandstone, and he descends into a garden *parterre;* on the right and left are the gardens proper, paragons of perfection; in the midst is a raised plateau, or "hanging garden," for rare and choice flowers. This elevated spot is of pure white marble, polished to the highest finish; the ascent is by steps, single blocks of this costly article. Costly it must have been, as it has all been imported and carried hundreds, aye thousands, of miles, over districts without roads, through jungles, over mountains, across rivers and quicksands. Here are they are, monuments—and instructive ones, too—of what is accomplished by perseverance, skill, and money. In front of this, in the midst of the garden, is a cistern or pool of water, with about a dozen *jets d'eau*, creating a refreshing air and coolness of atmosphere, with the rare treat of "sounds of water murmuring in the air," so much appreciated and only to be fully realised and enjoyed in tropical climates. The walks and borders of the flower-beds in these gardens are not made of gravel or other material to be continually weeded and rolled to be kept in order, but are rubbed sandstone, damaskeened in pattern by black and white marbles, and display a variety of designs truly surprising. Passing on, the visitor suddenly comes upon (forgive the term, holy of holies) the grand temple itself, to reach which an ascent of about 20 ft. must be made over steps, each of which is a single block of pure white polished marble; a broad plateau or dais is seen, all white marble, in which the polish is seen to be as perfect as ever. The glorious building now stands in full view, with its graceful outline and true proportions, the which neither envy, criticism, nor even malice itself has ever yet been known to discover a fault or blemish, so perfect is the whole. Another flight of broad steps, and another portal is entered. The sacred inscriptions and elaborate ornamentation are here, but more minutely, executed in precious jaspers and marbles; once again a few steps to be ascended, and the grand dome is reached. Here my pen and ability of description fail me to do justice, as does language to convey a just idea. I have used almost every term of excellence so frequently that I know not what to apply now without being guilty of tautology, so I will summarise, and say of all parts of the interior as being superlative in taste, delicacy, and execution.

The erecting of the dome, polished inside and out, of huge blocks of marble, many 10 tons in a stone, is of itself a miracle of art. The screen enclosing the sarcophagi is octagonal, about 35 ft. across, and is of the purest white marble that can be conceived, perforated in pattern with all the marvellous delicacy so often seen in works by the Chinese in ivory carvings, and with all the grace and originality of the Cashmere designers. The walls, doors, and screens are from 1 in. to 1½ in. thick; all the undercuttings and interstices of the perforations are as carefully and perfectly polished as the most exposed fronts. How on earth they were executed I am at a loss to guess.

The principal sarcophagus—for there are two—is said to be for the king, the smaller for his queen. (Query, Is not my suggestion correct?) It is from 3½ to 4 ft. high; the chief slab, about 18 in. from the floor, is 15 ft. by 12½ ft., 7 in. thick, white, without spot or stain. On this rests the "wonder of the wonder," the superstructure of the tomb, a block of pure white marble, damaskeened and inlaid in most elaborate patterns with jewels and costly stones, many flowers containing as many as twenty or thirty stones in each. Most of the material are red and green porphyries, agates, lapis lazuli, torquoise, aquamarine, topaz, garnets, and rubies; but the curiosity is the beautiful OG and other delicate and complicated mouldings in which they are set. Not in mere flat mosaic, but in the most delicate tracery are they wrought—an art, I believe, now lost.

The second sarcophagus is a duplicate, in miniature, of the king's. On each are short inscriptions in Persian—no more. They do not contain the remains, but are only the tombstones proper; the real sarcophagi are immediately beneath.

The walls of the fane itself are also octagonal, entirely covered with Moorish and arabesque devices in relief, containing the whole of the Koran, wrought in precious jaspers, precious stones, and marbles of various colours. The light admitted, as it should have been, is a "dim, religious light." The echo given back from such a mass of polished stone is remarkable; no doubt it was thought miraculous before the science of acoustics was understood. The echo is sustained with good effect 12 seconds. No painting or gilding has ever been applied; the whole pictorial as well as picturesque effect has been executed in stones. An attendant procures a light, if required, to descend to the chamber of the dead by a staircase. The whole of the steps, walls of passages, and chamber itself is entirely constructed of the same material. The sarcophagi are duplicates of those above, but of a coarser finish. I regret, however, to observe here the English custom of having a "bit to show" has been practised; this is now stopped by a careful and proper *surveillance*. Several of the leaves and flowers have been removed; the others are perfect. There are three of these marble mosques and domes, on marble bases, having tops or finials of copper gilt; besides these there are several other marble domes, resting on red sandstone bases. To add to the wonder and beauty of the whole, at each angle of the building rises a graceful slender minaret, or round tower, of white polished marble, to a height of 150 ft. having open lantern tops, from whence splendid views of the city are obtained; midway up are galleries, from which the Faithful were summoned to prayers. I presume the four were to emblemise the four quarters of the earth or winds of heaven. Be this as it may, these appendages form the *coup d'œil* of the building.

On leaving this place, of a visit to which this is an imperfect sketch, I wended my way back to my hotel, and as I journeyed alone moralised thus—How truly is vanity, vanity! Could that proud, vain monarch, who doubtlessly thought to secure a more than Elysian happiness and enjoyment with his houris in this his carefully-prepared attempt at everlasting bliss, but have foreseen that his fane and his ashes could ever even by possibility have fallen into the hands or been desecrated by the presence of the Infidel, these wonders would never have been constructed, nor would he ever have attempted to give immortality to anything mundane. I concluded it far better, more lasting, and more noble to build up a good name than the most glorious tomb; certainly far less costly and infinitely less difficult of execution than this grand toy, which now only serves (not the intention of the author) to display the vanity of the man, in stone and mortar, to excite the admiration of generations past and to come, to teach the moralist, and to prove what perseverance can effect. I reach my hotel, full of enthusiasm and perspiration after my walk in this tropical climate, both of which I shall try to cool by a glass of Bass's pale ale.

[It may be asked, *Cui bono* to publish such letters in a work like the *Mining Journal*. We reply, it proves the skill of the ancients in the choice of the material for splendid edifices, as well as the best methods of using them. Well would it have been had equal skill been displayed in London at present; besides which, Mr. Henwood is engaged on a most interesting tour in a comparatively unknown district for minerals, and No. I. certainly evidences a fine taste and careful attention.—Ed. *M. J.*]

Manufacture of Iron and Steel.—Messrs. Sharp and Webb, of the Bolton Iron and Steel Company, Bolton-le-Moors, have patented the use of steam instead of hydraulic power to swivel the converting vessel used in the manufacture of Bessemer steel. To render unnecessary the use of a counterbalance for the ladle crane, they propose to pass the crane pillar through a beam or girder above part of the casting pit, and to raise, lower, and turn the pillar by a screw motion. They employ a locking plate, as at railway points, to prevent the converting vessel turning before the air valve is opened; and, lastly, they make the spouts of the converting vessels at angles instead of opposite each other.

ON THE PROPAGATION OF MINING AND METALLURGY.

BY HYDE CLARKE, F.S.S., M.I.A.E.

One prehistoric question is the supply of metals and diffusion of metallurgic processes. It is presumed that this must have been effected by a highly cultivated race, most likely the Phœnicians. The subject is a wide one, and embraces many branches, and consequently admits of the attribution of more than one cause. All of these we may not, perhaps, find, but we may ascertain some of these causes. The history of the past is, to a certain extent, lost; but under some circumstances history repeats itself, and gives us representations of the past, just as a coin much faded on being heated will show for a few moments the obliterated legend. In some cases history is exhibited to us in the complications of ancient and modern institutions, which we see in the ruder empires; Turkey, for instance, where in the same plain the bullock cart of Homer and the railway locomotive are at work, the wooden plough of Hesiod and our latest steam plough. One of the repetitions of history is sufficiently well displayed in Western Asia Minor. The mountains called the Besh Parmak, or Five Fingers, to the south of the Mæander river, opposite the ancient Tralles, or modern Aidin, contain extensive deposits of hæmatite iron ore in the form of iron sand. I have reason to consider these deposits extend along the mountains south of the Mæander for above 100 miles, and that they are to be found in contiguous ranges to the north of the Hermus in the neighbourhood of Thyateira.

The Besh Parmak deposits are worked by gipsies or Chinganees. The workings are open pits, and the mineral is smelted with brushwood in small furnaces about a foot square. So far as I can ascertain, this resembles the mode of working followed in India. The iron, which is of good quality, is sold in the market towns of a wide extent of country by the gipsy men and women, chiefly in the form of horse-shoes. The Chalybes or Khalubes were, according to ancient historians, a mountain people in Asia Minor working iron, and spoken of from the mythic age down to a comparatively late historic period, when they were recognised in North-Eastern Asia Minor.

The Khalubes were hill tribes, and so are the gipsies. The Khalubes most likely worked several sites in Asia Minor, and were a tribe engaged in this business. The gipsies, as we well know, are engaged in iron making in many of the countries in which they are settled, and it is one of their hereditary callings. The gipsies within a few centuries spread over the whole of Europe, and might have introduced iron metallurgy. As we know, they did not, for they found it already established, but nevertheless they were in many instances able to engage in iron working. If, during the middle ages, the gipsies were able to do this, we have evidence for the possibility of like tribes in a very few centuries spreading as far as from Mooltan or Kashmere to Spain, Britain, and Norway.

The migrations of a low tribe of this kind are very different in their character from those of a high or warlike tribe. The warlike tribes, whether grazing or seafaring, have made their migrations in great numbers, fighting their way by strength of arms and meeting foes at every step. A low tribe, contented with a low state of existence, perhaps family life in a filthy tent, will rather creep its way along, having little to be robbed of, being unprofitable servants and subjects, and robbing and cheating the populations through whose midst it passed. As there are low parasites which pass through various forms and exist in different media, so it is with the low tribes; their conditions in migration may be very different from that in settlement, but they will migrate till they find their suitable parasitic abode. To low metal-working tribes, like the Khalubes and gipsies, we may look for one class of metal workers. The characteristic pursuits of low tribes are worthy of observation. Among those of low hill tribes I should place metal working, woodcraft, including timber cutting, and collecting honey and wax, and cattle feeding.

Gold working I consider to have been pursued very differently from iron working. It must have been much the same in all ages—an adventurous pursuit, carried on in the style of the Spanish expeditions in hostile countries; or, like Californian and Australian gold digging, in thinly peopled countries. Looking to the extensive supply of gold ornaments in ancient times, to the many known gold sites, and the present poverty of those sites, there can be little doubt that the diggings of Europe had been pretty well explored long before the historic period. The adventure of Jason and the Argonauts may be looked upon as the last of these expeditions, carried out on old traditions.

The Iberians, or the anterior races seated on their territory, must have pretty well exhausted the gold diggings. The Phœnicians I look upon as later participators in the commerce consequent on these operations. The Iberians of the East and their predecessors we must consider as the explorers of the Black Sea, and the Caspian, and their river systems; the Iberians of the West as the explorers of Gaul, Britain, and the Baltic. The real chronology of Phœnician nations will depend on the appearance of the Semitic race upon the theatre of the East, probably not much before that of the Indo-Europeans themselves, relatively later in the world's history than we have been accustomed to allow for. If it be true that the Iberians held the greater part of Asia Minor before the Hellenes, if, too, we can now by recent discoveries recognise an influence of Assyrian and not of Egyptian type in Asia Minor, so we must hesitate in acknowledging this influence as a primary action. The nationalities of the north and the south of Eastern Asia Minor show evident signs of displacement, and if we are to look upon the tribes of the Cauçasus as allied to those of Central Asia, and displaced by Semitic and Indo-European invasions, then we may have to assign to the eastern border of the Iberians an extended and more ancient limit. However this may be, whether the gold working of the Caspian were effected by an Iberian or a Caucaso-Tibetan race, the operation would always be the same in the first instance—surface workings by bands of explorers

or marauders. These might in some cases be succeeded by low races carrying on gold washing as in India, or by slaves as in Africa. The gold diggings would, however, become poorer and poorer by exhaustion, and further supplies would be obtained at a later period by casual discoveries, or by the hard labour of gold working.

The supply of tin I look upon as contemporaneous with the supply of gold. Most tin grounds contain gold, and some gold countries contain tin. Cornwall still yields its grains of gold, and Australia and Peru afford tin. Tin is still in some examples found in the shape of dust as well as stones. The scattered and outlying supplies of tin might first attract attention before the main supplies of tin in Spain and Cornwall concentrated attention for mining purposes. It is by no means essential to assume that these were primary centres, as the ready discovery of a small quantity of tin elsewhere may have caused search in the other formations. America may have supplied tin before Britain. Of the origin of copper mining it is less easy to form an idea. It is most likely that, as the metals gold and iron were known in grains or sand, so copper sands first attracted attention, and that the exhaustion of the easily fusible minerals led to the adoption of the harder sulphurets and carbonates. So, too, as to the origin of bronze it is more difficult to suggest, and yet at a very early period the solution must have been effected.

Metallurgy once generally developed, the working of the readier forms of lead and silver lead ores is an easy stage. There would be a wide difference between the rude metallurgy of the gold diggers and the hill workers, and the more refined operations as surface supplies became less available, and the demands of civilisation were greater. Then we reach another stage; slave and convict labour was extensively introduced, and vast enterprises were carried on year after year, of which we see the remains in ancient Spain, and know the mode of working in the mines of Southern America.

Iron may have been worked almost as early as copper, but, on account of its being found soft in the early manufacture, it may have been neglected, like lead and silver, and like them postponed to other metals. The same tribes may have been indifferently, according to geological location, copper, iron, or lead smelters. The smelter once on the spot would not be readily displaced. The neighbouring chief would be contented with tribute in kind, and the shepherd or husbandman of the plain, with his women, would have small liking to change places with the miner and his grimy host.

Government Inspection of Coal Mines.

Referring to the WEST LANCASHIRE and NORTH WALES district, Mr. PETER HIGSON observes that the great and deplorable loss of life has not in all cases been the result of what are often miscalled accidents, although there are many that may be justly placed under that head, but of mismanagement, disregarding established regulations, insubordination, and reckless proceedings on the part of the workpeople. The employment of persons not accustomed to underground labour has in a great measure been forced upon mine-owners by the strict observance of the men to the rules and regulations of the Trade Union, by which the workpeople have now obtained higher wages than formerly for doing less work. For the purpose, therefore, of maintaining the the out turn of coal, and of supplying the gradually increasing demand, employment in one capacity or another has been found for almost every applicant. It is, however, much to be regretted, that while the improved circumstances of the miners is conspicuous throughout the district, they are not as a rule so careful of themselves nor so controllable as they were in less prosperous times.

Upon making a careful analysis of the list of lives lost, he finds that 40 occurred through their own disobedience and carelessness; 52 by accidents beyond control; and 59 under circumstances of a different character, many of which he is of opinion might by better management have been prevented. The difficulties with which mine-owners and managers have frequently to contend are not easy to explain. They are found in various shapes, and often turn up when least expected. In making explorations through faults, and in broken and unworkable ground, a large and in many places an almost hopeless outlay has to be incurred in searching for the mines, without perceiving even a trace of anything to give encouragement. Operations of this kind are, as may be easily imagined, often begun and carried on in a parsimonious manner, so that upon reaching the mine, or any point at which deleterious gas happens to be freely emitted, the preparations for safety are found inadequate. From this, and many other causes, loss of life is of more frequent occurrence in working mines of that description than it is in those mines wherein the strata are continuous or unbroken. The former prevails over a large portion of his district, which, together with the character of the mines, renders the general use of gunpowder indispensable; and as explosive gas is largely emitted, blasting either stone or coal is always attended with personal risk, and demands the most careful supervision.

That there are still many mines inadequately ventilated no one will venture to deny; and although recent events may cause suspicion to rest upon all, to a large majority it cannot fairly attach. Immense changes and improvements have taken place throughout this district during the last 10 years, not only in the system or mode of working the mines, on which, in the main, the very ground work of the safety of the workpeople depends, but in the preparations and supervision also of that and every other department of the works above and below ground. Yet it cannot be said that many collieries are in what may be called a perfect state; and this occurs in consequence of their unfixed and constantly altering character, by the working places of the men being daily carried outwards from or backwards towards the eye of the pit. The great and rapid increase of trade also has brought overlookers into situations of greater responsibility than they are able to bear, the demand for competent persons having exceeded the supply, while with young and inexperienced owners the best candidates for an appointment are not always successful. Almost, if not all, explosions in mines are, and should always be considered, preventable; at times, however, when a crisis occurs, the best efforts may fail, and the result prove a misadventure. Their origin may in almost every instance be traced to some defect, either conspicuous or remote, in the ventilation, the mode in which it is produced, or in the general arrangements and system of working the mine. Persons of limited experience often incur great risk, and cause many casualties, by allowing the ventilation to depend upon doors and brattice, and the air to flow through all the works of the mine in one current; instead of dividing the workings into distinct and separate districts, and drawing from the main inbye stream a sufficient supply of pure air for each, every place is connected, and in the event of a slight explosion occurring, exposed, if not to the actual blast, to the after-damp which follows, which is almost as destructive. It is, therefore, manifest that the workings of every mine should be divided into proper districts, and that each should be ventilated by a separate split of air, which on passing thereout should be conducted to the upcast pit.

In some mines apparently good ventilation has been overpowered by a sudden outburst of gas, but such a thing very rarely takes place. Yet explosions which happen through bad ventilation are often attributed to a sudden outburst. Their origin, however, in most cases, as well as that of many of the casualties of the year to which these observations refer, may be traced to the mode in which the mine was being worked at the time they occurred.

If in all cases narrow or strait work were to be driven from the eye of the pit to the boundary of the mine intended to be got, and substantial pillars of coal left in the intervening spaces to support the underground roads, a considerable portion of the gas would be gradually and quietly drained away before the time arrived for removing the pillars; when the main roads reached the boundary, pillar working might commence, in such a manner as circumstances might render most desirable. Beginning at the extremity in every instance, and working backwards, or towards the pit, thereby leaving the goaf behind, which may always be kept safe by passing a strong current of air along the edge thereof. It is now more than 30 years since he first adopted this mode of working in some of the mines of which he was then the manager, and which has he finds been continued to the present time with success. The system recently practised in the Wigan district, which still exists in some of the old collieries in North Wales, prevailed throughout Lancashire at an earlier period. It consists of taking out too large a proportion of the mine at the first working, or when opening out leaving inadequate pillars of coal for the second or homeward working, the removal of which is always attended with increased risk. In Lancashire the first operation is called drifting, the second pillar working. In North Wales they are respectively termed wicket and pillar.

The final success of mining depends more upon the skill and judgment used in first laying out the works than most people seem to think, and in almost every instance success in trade produces in proportion to the workpeople greater or less protection; around a well-arranged and prosperous colliery he finds as a rule, a more settled and intelligent population, and there are fewer accidents than there are in those places which are less fortunate in business. If, then, people could only be induced to employ competent mining engineers and viewers to lay out their works, and make a periodical inspection of the same, casualties of all kinds would, no doubt, be diminished in number, and much loss of life be prevented. As it is not improbable that the annual sacrifice of life in and about mines may have contributed largely towards the present limited supply of labour, it seems to him a question to which mine owners should give their serious attention.

During the year reported upon, Mr. Higson inspected all the mines in his district in which loss of life has happened, and enquired into the cause thereof; inspected all mines described to him by letter or otherwise as being in any way dangerous; and the remainder of his time was occupied in inspecting such mines as, from his previous knowledge and experience, he had reason to suppose were surrounded with more than an ordinary amount of risk. He not only found it impossible, but in some instances inexpedient, to make periodical inspections of mines; and although people may say, and believe, that if the present system is now proved to have been beneficial, inspection on a more extensive scale must necessarily be still more so, and that by increasing the number of Inspectors there ought to be a corresponding decrease of all accidents, and to a certain extent it might so happen; but if inspection were carried beyond a judicious limit a contrary effect might be produced; frequent inspection would in many instances cause the owners and managers of mines to rely too little on their own energy and skill, and too much on the Inspector. Those who have the control of the works should the responsibility also; but if the Inspector were to make a weekly visit to a mine, he would find it difficult after a time to avoid that responsibility which his visits would naturally create. He thinks, however, an intermediate course might be safely steered, which would afford ample inspection without giving too much. If, therefore, it be intended to make further regulations, and enlarge the means of inspection, he is of opinion that the appointment of assistants to the present staff of Inspectors, consisting of a number of young men of respectability and of good education, such as are annually passing an examination at the School of Mines, or who have graduated at one of the Universities, or who have served an apprenticeship as a viewer or mining engineer who should act under the directions of a superior officer, would supply the necessary aid.

Concerning the MIDLAND DISTRICT, comprising the counties of Derby, Nottingham, Leicester, and Warwick, Mr. THOMAS EVANS states that, although the accidents from falls of coal, roof, and sides of workings were considerably less than in the two preceding years, it still remains the most fertile source of accident. The deaths in the district for the past 11 years were 254 lives lost by "falls of roof," as against 59 from "explosions of gas." In many cases the unfortunate sufferers are themselves to blame; they are so accustomed to danger as to become somewhat reckless, and will not, even after they are cautioned, secure the roof as they advance. On the other hand, a practice prevails at some of the collieries, indeed, at the largest in his district (the Butterley Works), of making the colliers pay for the timber used by them in propping the roof. This he considers to be a practice attended with much evil; a strong inducement is held out to the workmen to use as little timber as possible, often not sufficient; the collier, probably, has to pay from 2s. to 3s. a fortnight out of his wages. He has pointed out this matter to the managers of the mines, and with them now rests the responsibility of continuing a custom so fraught with danger. A fall of roof at the Butterley Company's mines killed a miner. The owners or agent did not give the Inspector notice of this accident, as they did not consider the mine came within the meaning of the Inspection Act; in fact, that it was not worked "in connection with an exhausted mine." At the request of the coroner, Mr. Evans attended the inquest, and after hearing the evidence, no doubt was left in his mind but that it was worked in connection with the old black shale colliery, indeed, through the original shaft. In this case the timber used for supporting the roof is paid for by the ironstone workers, and the evidence was very clear as to the insufficient supply of timber, and consequent bad state of the roof; and so it will be so long as this practice continues.

It is most important that all mines of ironstone of the coal measures, all argillaceous mines, whether worked in connection with coal or not, should be included in the Mines Inspection Act. At present it is most difficult to understand what the Act really does mean, and what interpretation to put on the words "any disused or exhausted coal mine." It was contended by Mr. Fowler, the managing director of Sheepbridge works, that his mines at Glasshouse Common were exempt, and that he was not obliged to have rules, signals, breaks, indicators, and so on. Mr. Evans, however, thought differently, and as it appeared to him to be exactly a similar case to the Messrs. Appleby's (and fully reported on last year), he instituted proceedings before the magistrates, and they decided the ironstone mine was worked in connection with the disused black shale coal workings. He objected to the system of having only one engine to wind from 12 to 16 shafts at unequal depths and varying distances. A sketch of the winding arrangements at Messrs. Appleby's mines accompanies the report, and presents one of the most remarkable instances of misapplied ingenuity that could possibly be imagined.

Complaints have been received from the workmen employed at several collieries in the district and he has in each case taken an early opportunity of investigating them, and occasionally has not found matters in so satisfactory a condition as they ought to be, but generally on representation to the owner or manager every attention has been given to his suggestions. It is well known to all practical men of the district that inspection of mines has proved to be most beneficial, probably not to the extent anticipated by the public, who in forming their opinions, and drawing conclusions of the death-rate, lose sight of the enormous and sudden increase in the quantity of coal worked, the necessary development of the underground workings at greater depths, giving off larger quantities of gas, and the employment too often of inexperienced hands, induced to follow the occupation of miners by the high rate of wages offered. Referring to Inspection, he remarks that at present the Inspector is always in his district, ready to receive complaints and investigate them, to enquire into the cause of accidents, and generally to advise on any matter presenting a difficulty. It is impossible to prevent accidents altogether, and if the owner and agent are relieved of responsibility, on whom is it to fall? Certainly not on the Government, unless they undertake the management of the mines altogether, and appoint as many Inspectors as there are now agents, with power over the expenditure. He would be glad to see the provisions of Lord Campbell's Act made so as to be within the reach of the friends of any person injured, and when any violation of the rules can be brought home to the owner or agent substantial compensation be paid by them.

As to the NORTH STAFFORDSHIRE, CHESHIRE, and SHROPSHIRE DISTRICT, the report of Mr. WYNNE states that he has long been of opinion that it is a farce to allow powder to be used in those workings where safety-lamps are exclusively used, and he hopes to see the day when it will be strictly prohibited, not that much less powder will be used, but more competent men will be employed to conduct the operations of mining, and owners will find that it is cheaper to employ men of known ability, rather than those well-meaning, but ignorant, persons, whose mistakes are tolerated because the owner neither sees nor hears of what is going on underground, or he would soon find that good management is the cheapest, and reduces fatal accidents to a minimum. The accidents from falls of roof and coal are less in number, and the loss of life is also less than in any former year, which somewhat bears out his opinion that this class of colliery accidents may be kept within reasonable bounds if due care is taken to prop the roof, whether danger be foreseen or not, for nothing tends more to endanger the lives of colliers than that false security which is engendered by "knocking" on the roof with the pick, and because it sounds solid from its thickness going to work under it, instead of setting up a prop or two to make it really secure. It is but just to observe that a vast improvement in the system of timbering has taken place within the last few years, owing in a great measure to the workmen themselves seeing the advantage of obeying a rule made for their own protection, rather than pursuing the old irregular mode of timbering, that had no rule of guidance but the convenience of removing the fallen coals. Wherever the underlookers insist on the timber being set, whether wanted or not, very few lives are lost by falls of roof or coal.

Under the head of miscellaneous accidents underground comes those numerous ones that occur on inclined planes and horse-roads, the work on which is particularly dangerous, and is generally performed by boys, or other young persons, who are least likely to take care of themselves. In cannot be too strongly impressed on those engaged that they should never go before the tubs when starting them down the incline, nor when the tubs get off the rails attempt to replace them without the assistance of an extra man, nor attempt to catch the tubs at the bottom of the jig, for, although it is much easier to twist round the tubs whilst in motion, it is highly dangerous to do so. Several lives have been lost, and many limbs broken, through boys attempting to unfasten the horse from the tubs whilst in motion; and the roadman and the hooker-on should have strict orders to report every case of the kind that comes under their notice.

The loss of life in ironstone mines has been serious during the year; but when we consider the large quantity of mine that has been raised from the thick seams of North Stafford, and the dangerous nature of such seams, we must not expect to be free from severe and heavy falls of stone with even the best propping; still, all that has been said about coal applies in a still greater degree to ironstone, because very large masses come down at times with but little warning.

MANSION HOUSE COLLIERY RELIEF FUND.

The committee formed at the Mansion House, in the mayoralty of Sir Thomas Gabriel, for raising a fund for the relief of the widows, orphans, and aged parents of the men who perished in the calamitous colliery accidents at the Oaks Pit, near Barnsley, and at Talke, in Staffordshire, held a meeting on Monday for the appropriation of the money subscribed on the occasion. Lord Wharncliffe, Lord Milton, M.P., Mr. Blackett Beaumont, M.P., Mr. Walter Spencer Stanhope, Dr. Jackson, Mr. Charles Newman, Mr. Richard Inns, and Mr. G. Atkinson attended by invitation as a deputation from Barnsley, and Mr. Adderley, M.P., Sir E. Buller, M.P., Mr. Smith Child, and the Rev. Sir L. Stamer, rector of Stoke-upon-Trent, represented the widows and orphans of the miners who were killed at Talke. Sir Thomas Gabriel, the late Lord Mayor, occupied the chair as president of the committee, and the other members of it present were Sir Sydney Waterlow, Mr. Samuel Morley, Mr. G. P. Gassiot, Mr. Alfred de Rothschild, Mr. W. J. Maxwell, Mr. Frederick Thompson, and Mr. Joseph Gibbs, private secretary to the Lord Mayor. Mr. Gibbs reported to the meeting that the total amount subscribed at the Mansion House, including interest, was 24,959*l.* odd; that, in addition, 2800*l.* had been subscribed at Liverpool, and 1150*l.* at Halifax. In addition to these, again, 29,528*l.* odd had been collected in Yorkshire for the relief of the Oaks Colliery sufferers, and about 13,500*l.* for those at Talke. With these facts before them the Mansion House committee, with the aid of the local representatives, proceeded to consider and settle a scheme of relief for the widows and families of the sufferers by the Oaks Colliery calamity, which had been prepared from authentic data, and partly upon the basis and experience of that of the Hartley colliery, by Mr. W. P. Pattison, an actuary. Previous to the meeting this document had been most carefully scrutinised and sifted, both in the interest of the subscribers and of the sufferers, first by the general committee at the Mansion House, and afterwards particularly again and again by Sir Thomas Gabriel and Sir Sydney Waterlow, after which ordeal it underwent examination at the conference, and was finally adopted, subject to a possible rectification of a few of the items. The investigation lasted upwards of three hours, but the public, and especially the subscribers, will probably be more interested in the general result than in any detailed account of the steps by which it was arrived at. That result, as respects the Oaks Colliery, was substantially as follows:—In class 1, headed "Annuities to 142 widows," the committee set aside 19,202*l.* as the value of liability for the whole term of lives, after a deduction from annuities terminating on marriage; 2835*l.* for annuities to eight widows of volunteers and one blind widow, after a deduction for annuities terminating on marriage; 2732*l.* for 133 girls; 4244*l.* for 161 boys, the children of widows in both cases. In class 2, for parents who were supported by their sons, the committee set apart 1638*l.*; class 3, orphans, 109*l.*; class 4, parents partially supported by their sons, 1511*l.*; class 5, children of single women, 268*l.*; class 6, men and boys who were burnt, 100*l.*; class 7, destitute young women, 13*l.*; class 8, posthumous children, 626*l.*; education, say, 888*l.*; outfits, 898*l.*; apprenticeship premiums, 375*l.*; industrial homes, 2182*l.*; marriage portions, about 1342*l.*; medical attendance, 1000*l.*; funeral expenses, 162*l.*; parents not already provided for, 50*l.*; and for future expenditure, 1050*l.*; making in all, 41,225*l.* The effect of the scrutiny on Monday, and at previous meetings, was to reduce the original estimate of the actuary by a sum of from 7000*l.* to 8000*l.*, which, or some part of which, will go towards a fund for the relief in future of sufferers by any similar calamity. So far with regard to the Oaks explosion and the relief of the consequent distress.

In the case of Talke, the local subscription amounted to about 13,500*l.*, and the local committee had expended about 1300*l.* In June last the Rev. Sir Lovelace Stamer, the hon. secretary, in a letter to the Lord Mayor's committee, said, in effect, that he believed the sum then in the hands of the local committee was sufficient to answer every claim upon the fund arising out of the accident, and that they (the local committee) had then mainly to consider the establishment of a permanent fund for the relief of sufferers in that district from similar calamities, such as existed in the colliery districts of Northumberland and Durham. On Monday, Sir L. Stamer explained that in South Staffordshire the local committee, after the accident at Talke, had from the first contemplated the formation of a permanent relief fund there, in order to render those extraordinary appeals for aid unnecessary, and that towards such a fund they had always expected to receive from the Mansion House Committee a sum proportionate to the disaster at Talke. Upon that explanation, the committee yesterday made a grant of 1500*l.* to the authorities at Talke towards their local permanent fund, or rather with the view to recoup them their actual expenditure, and something more, in the relief of the sufferers by the calamity. Originally the Mansion House Committee acting upon a suggestion made to them on their formation by Lord Derby, founded on his experience in the administration of the Lancashire Cotton Famine Fund, expressly stated in their public advertisements soliciting subscriptions that in the event of the public benevolence furnishing funds more than sufficient to meet the requirements of that particular emergency the balance would be retained in the hands of trustees as the nucleus of any similar subscription it should be thought necessary at some future time to raise for the purpose of meeting a like calamity.

Both Sir T. Gabriel and Mr. Samuel Morley dwelt upon the wisdom of that precaution, as shown by the event, without which the whole of the Mansion House Fund would have been divisible *pro rata* among the families of the sufferers by the Oaks and Talke explosions, without reference to the absolute requirements in either case. But now, by the operation of that saving clause, the committee will have a very considerable surplus at their disposal, probably as much as 12,000*l.* or 14,000*l.*, for the mitigation of distress consequent upon similar accidents; and, as if to confirm still more the wisdom of that precaution, the Ferndale calamity occurs just at the time when a surplus arises and remains in the hands of the trustees for disposal.

Royal School of Mines, Jermyn-Street.

MR. WARINGTON SMYTH'S LECTURES.

LECTURE V.—Having so far examined the structure of the mineral deposits and other matters connected with them, the next point to consider (said Mr. SMYTH) would be the direction in which the veins ran in different districts—a matter of importance as regarded the general character of the minerals they would contain. In Cornwall they ran about north-east to west-south-west, not quite true east and west, but, notwithstanding that, the miners usually considered that east and west was the proper direction of tin lodes, and although they deviate very considerably they are always called east and west veins to the end of the line. This practice was carried to a somewhat loose extent when they got into a district where the veins coursed in different directions. At St. Austell, for instance, there was a group of veins which were carried some degrees south of east, and these were called caunter, or contra, veins; but when they ran completely across, they were termed cross veins, or cross courses. It was the east and west veins and the caunters, which ran at a slightly different angle, which bore the tin ores of the district, with occasionally lead, while the cross veins never yielded those metals. The former, or true-running, veins were filled with quartz and calcareous spars, and the like, while the cross courses were mostly filled with a soft clayey material, and called flookan. The metal produced by these cross-courses was almost invariably limited to lead, in the shape of galena, which was occasionally highly argentiferous, and also iron ores. Thus, the north and south veins might be said generally to bear iron and lead, while the other metals were generally found in the veins running at right angles to them, or roughly from east to west. Almost the only exception to this rule was found in the district of St. Just, which was remarkable for two veins, which although they crossed each other at nearly right angles produced the same metals. If they turned to the other parts of England, and to other countries, it was remarkable to find this east and west direction maintained. In South Wales all the more productive veins pointed a little to the north of true east and south of true west. In the Derbyshire and the great limestone region, including Durham, Northumberland, and Cumberland, the same fact was observable; and if they crossed to the Continent they would find it there. Pointing to a map of Saxony, on which the lodes were marked, the lecturer said that the hundreds of veins there depicted might easily be divided into groups, each having a definite direction; but the largest of which ran east and west. In the Harts the veins ran north-east and south-west; in those of Schemnitz, in Hungary, and in those of Spain, the direction was the same, with, of course, here and there some few exceptions. The Cornish rule held good with respect to the veins of auriferous quartz in Australia, which ran north and south, just as in Cornwall the veins in that direction bore silver, if not gold. It was noticeable, too, in Australia, that the veins which ran in sundry other directions seldom bore the same class of minerals. Without multiplying examples, the rule of direction which he had described was a general one. The next question was, how far the veins extended in depth, and how far down they might be expected to be productive. This was one of the most interesting subjects that could be submitted, not only to miners but to geologists and philosophers. It was a complicated question, but it was one intimately coupled with the extent and nature of the mechanical appliances, as well as their increased cost, as workings went deeper and deeper. In fact, if mines were to be carried very much deeper than they were now, less expensive, and at the same time more powerful, machinery must be discovered. However, as matters now stood, the depth of veins was a matter of the most vital importance. In "Williams's Mineral Kingdom," a work of some note, published at the end of the last century, veins are represented as gashes. Although there were some which were very properly called gash veins, he (Mr. Smyth) considered the idea to be based on a fallacy. No doubt in the limestones there were openings worked out by the agency of water, and the material found within the opening had been washed in, and so they were limited in depth, and came to an end. But even in cases of this sort the appearances were very deceptive, and a little more search would give the fissures a different character. One of the most notable examples cited by Williams in support of his theory was that of Llangynog, a mine belonging to the Earls of Powis, who had been greatly enriched in past generations by working the vein there found; but at length the vein disappeared, and seemed completely to finish at a point in the clay-slate rock. A few years ago some of the adventurers cleared out the old working, to examine it, and they found that the vein had not entirely disappeared, as Williams stated, but was continuous, in a greatly diminished form, into the stratified rocks. This was almost invariably the case, and in the mountain limestone, where the facts could be made out distinctly, innumerable instances of the kind had been found. The most formidable obstacle to penetrating great distances below the surface, however, was the expense. The late Marquis of Breadalbane, a very enthusiastic miner, found a vein when out deer stalking near Loch Tay, consisting of galena, rich in silver, and with a little gold. He worked this with great tenacity long after it ceased to pay expenses, and did not desist until the vein became utterly invisible. A geological examination of the hill explained the whole thing. The bulk of the hill consisted of the ordinary mica slate of the district, in a condition recognised by the miners as uncongenial for metallic veins, but it was capped by a mass of rock of a different character, exactly of the kind in which galena might be found. No doubt it was very remarkable that fissures should go down so far into the earth, and be filled to such great distances with the same material, and yet there was abundant evidence of that kind. The Samson Mine, at Andreasberg, was sunk 400 fms. on a vein which often was no more that 10 or 12 inches in width: the silver obtained being considerable enough to render it possible to work at this great depth. In Tresavean Mine a cross vein of moderate size, from 3 to 5 ft., was worked to the depth of 240 fms. from the surface. At length, although it could not be said to have given out, the expense of working a comparatively poor vein, at that enormous depth, became too great, whereupon the machinery was taken up, and the water let in. Last year, he was sorry to say, another mine in Cornwall was abandoned from the same cause. The Fowey Consols, 30 years ago, was one of the most important mines in the country, but at length the lodes had been reduced to that pitch of poverty that last autumn it was determined to abandon all the deep workings, and he (Mr. Smyth) had had the advantage of going with Mr. Kendall, M.P. for East Cornwall, through all the lower workings, to satisfy themselves that the vein was really so much impoverished. Cases were by no means unfrequent in which veins might be worked with advantage at 60 or 80 fathoms from the surface which would not pay if the workings were carried to greater depths. It seldom happened that miners got below 300 fms. without being smothered by expenses. An interesting controversy had been suggested by these facts—whether the precious metals did not diminish in quantity in these lower depths? This had been the case in many instances. At Schemnitz native gold used to be found at a moderate depth, but at 150 fms. it had entirely disappeared. In the next 80 fms. the silver in like manner disappeared, to so great an extent that the chief sustentation of the mine was derived from the shallower workings of copper and lead. This question had a particular importance with regard to the gold workings of California and Australia, and it was generally held that small veins were not likely to be productive at any great depth, but where they are large, and associated with certain sulphates, they would likely yield to the greatest depths. At the St. John del Rey gold mine, in Brazil, people used to fear, a few years ago, that below the moderate depths then penetrated the richness of the vein would disappear; but now they were down 160 fathoms, and that depth did not appear to injure the character of the vein in the least. In the same way, the richness of the mines on the Tamar and in the Harts had not diminished, although they had far exceeded 300 fms. Circumstances of this kind depended upon the character of the rocks through which the veins passed, considered not so much with regard to their geological names as their physical condition. Thus, granite was granite in the estimation of some people, but if it were in a hard condition, suitable for building the Thames Embankment, they would seldom find that veins could live, as the miners would say, in such a rock. But when they came to a granite in which there was more or less felspar in a decomposed state—as, for instance, like that at St. Austell—they would find it full of strings in which tin was present, and this particularly when the vein was strong, and not mastered, as it were, by the granite. In some of the elvans, in the Cornish greenstone, where they find a sort of crystalline hornblende, they were extremely likely to find ore; and in other districts there were greenstones remarkable for their productiveness when they were of a soft earthen character. Granitic porphyry was also a promising kind of rock, and the clay-slates, or killas, of Cornwall yielded vast quantities of the most valuable ores. Mr. Smyth concluded by noticing the structure of other vein-bearing rocks in different parts of the world, recommending the students to pay great attention to this branch of the subject.

LECTURE VI.—Continuing his remarks on the distribution of veins, Mr. SMYTH said that in Yorkshire miners were in the habit, where the stratification was thoroughly well known, of making a drawing to scale of all the beds, showing their thickness and proper alternation. When they came to a throw, they had then only to ascertain the amount of displacement of any one bed, and then, by cutting the paper in two vertically, and putting it together again, so as to show that displacement, they were able to see at a glance the relative position of all the other beds, as effected by the throw. In this way conclusions might be formed of considerable importance, and a good guide be obtained as to the expenditure of money for purposes of trial. To spend money in any but the most likely places was a mark of great carelessness, and might jeopardise the very existence of an undertaking. It was the necessity which continually arose for making trials which rendered this point so extremely vital. If they took a hundred mines, only ten, probably, would be paying a profit, perhaps half would be raising ore enough to pay costs, while the remaining forty would be working at a loss.

Everything, therefore, that could assist in forming a right judgment was valuable, even if it were as simple and as easy of application as the rule he had just described. In searching for ores one of the most important preliminary considerations was the character of the rocks in which the search was to be made. If they took some districts in Cornwall they would find the granite of considerable variety in its quality, and they might expect to meet with tin, but it was never found at any great distance from that rock. It did not follow that all granite would yield tin, for he knew wide districts of granitic country which had been examined from end to end without yielding a grain of vein or stream tin. He might cite Britany, Bohemia, Saxony, Spain, and Portugal as to the connection of tin with granite; and the rule was that it was never found at a greater distance than one mile, except in a very few instances, and then certainly not more than two miles. Of course, stream tin might be found at greater distances, but that in no way affected the rule. Almost the same thing might be observed as to copper and other ores, the distance at which copper was found from the granite not exceeding three or four miles. If they took the neighbourhood of Tavistock, where the great lode of the Devon Consols existed, they would find the same thing. After copper came the ores of lead and silver, at much more considerable distances; and these facts had been noticed not only in Cornwall, but all the world over. The lecturer then referred to a geological map of Cornwall and Devon, pointing out the curious manner in which the lodes clustered around the masses of granite scattered over those counties. M. Tournal asserted that no productive lodes existed except in rocks of an igneous character. If he had stated that lodes were most productive where two rocks met, or near the junction of two different classes of rock, it would have been more to the purpose, but even then adverse cases might be brought forward. In Derbyshire, near Bakewell, there was a mass of mountain limestone side by side with the millstone grit, where the lodes cut through and had been productive in both for some distance, but they never penetrated very far from the line of junction between the two rocks. The same thing occurred in Flintshire. It was not, however, easy to predict what condition was likely to be the most productive. Thus Mr. Henwood, in describing the mines of silver in Peru, said that at Chanarcillo the lode passed from the granite into the limestone, and then became rich, which was just the reverse of the theory of M. Tournal. Besides, granite differed very much in its physical character in different places; and while the lodes clustered round the bosses of granite in Cornwall, the interior of those bosses was like building stone, and no veins had been traced in them. The next point to be considered was the appearance of the lode at the surface of the ground, a matter of importance, because it might influence very considerably the supply of capital, and because it severely tested the judgment of the mining engineer, inasmuch as it was only in a minority of cases that the mineral at the surface was like what it would be when worked at a depth, and some few well-known veins never reached the surface at all; as, for instance, Wardell's vein, at Foxdale, in the Isle of Man, which yielded a great deal of argentiferous lead ore, was found by a fortunate cross-cut, and had never been made out at the surface. In some cases the lode would yield ore up to the roots of the grass, as the miners said, while in other cases it was so changed by the action of air and water as to present no points of recognition at all. Of course, a great deal depended on the texture of the surface covering. If that covering were clay, which would exclude atmospheric agencies, they might find, as in Wales, galena close under the vegetable soil, while if it were copper that would be an unusual circumstance. The reason of this was that galena did not readily decompose, while copper pyrites decomposed with facility, and that down to a very great depth. On the other hand, it sometimes occurred that the lode withstood atmospheric action better than the country, and then the veins would stand up like a wall, and might be readily traced for miles. At Bethlwyd there was a vein of this kind, containing zinc-blende and galena, embedded in a wall of very hard and compact quartz, which extended a very considerable distance. In the stratified deposits the vein would sometimes be indicated by a depression on the surface, distinctly tracing its course. It frequently happened when the lodes were changed in character to a great depth the miners would despair of obtaining any return, and would desist, although beneath there were at no great distance heaps of untold wealth. This was exactly what happened at the Devon Consols. The old miners discovered the lode, and found it was filled with a reddish-brown material. They sunk 10 fms., and found nothing better; they then, after some hesitation, descended to 20 fms., and still finding nothing but this red ochreous material they then gave it up. Years after the works were resumed, and what was left of this red material was quickly worked through, and the miners struck into that great mass of rich copper ore which had yielded in pure profit no less than a sum of 1,000,000*l.* sterling, besides enormous amounts spent on the mine. This dead material, or gossan, as it was called, varied in its character. There was often a great deal of brown oxide of iron in it, and when it happened to be of a light-brown colour the miners then thought that it promised well. The gossan should be frequently inspected, and if anything was detected in it besides its ordinary ingredients, it was important to make out what it was. Thus some of the gossans were coated by malachite, which was an indication that copper existed, but it did not say much for or against the richness of the lode. That must be judged by what other gossans had done in the district. The lecturer then gave a number of instances in which gossans had been found to go to a great depth, in some cases reaching 150 fathoms, and not unfrequently they had sunk so deep as to break the hearts of all their shareholders. After 50 or 60 fathoms they might, however, generally expect in a large lode to reach ore sufficiently abundant to yield a profit. In Germany the miners liked the gossan to have in it indications of the presence of iron; and they had an old rhyme which might be translated thus:—

"A lode will ne'er cut rich and fat,
Unless it shows an iron hat."

The miners put a good deal of faith in this idea, and frequently neglected some sorts of gossan for others which they thought more promising.

FOREIGN MINING AND METALLURGY.

The sale prices of iron and plates do not improve in France. The Paris, Lyons, and Mediterranean Railway Company has just let a contract for Bessemer steel rails to the Chatillon and Commentry Forges Company; the rails are to be delivered, by the establishment named, at 12*l.* 8*s.* per ton at the works. The permanent way question is a subject of constant study and examination among the French railway companies. One company is said to be contemplating not only the renewal of its old rails, but also the replacement of the wooden sleepers by iron ones. In this case, the old rails may possibly be used in the manufacture of the sleepers about to be laid down. Some works in the Nord, which had attempted the rolling of rails from pig made with scoriæ, have come to the conclusion that the products obtained do not present the necessary guarantees as regards solidity. The forgemasters of the Champagne district held a general meeting a few days since at St. Dizier. A report was presented from a provisional committee, previously appointed at Joinville; this report was read and adopted. It was also resolved that a statement on the warrant system, drawn up by a St. Dizier forgemaster, should be published. A scheme for a new tariff system, to be submitted to the Eastern of France Railway Company, was presented for consideration, and several delegates were charged with the duty of conferring on the subject with the directors of the company. The French Marine and Railway Blast Furnaces, Forges, and Steelworks Company will pay, on Nov. 30, the first half of the dividend for the exercise 1866-7, or 1*l.* 4*s.* per share. Meetings are announced as follows:—Basse-Indre Forges Company, Nov. 29, at Paris; Santander Mines and Forges Company, Nov. 29, at Paris; Franche-Comté Blast Furnaces and Forges Company, Nov. 30, at Besançon; Pontgibaud Mines Company, Nov. 30, at Paris; Ahun Collieries Company, Dec. 5, at Paris; Solenhara Blast Furnaces (Corsica) Company, Dec. 7, at Paris; Bonne-Esperance and Bonne-Veine United Collieries Company, Dec. 10, at Paris; Ferfay and Ames (Pas-de-Calais) Colliery Company, Dec. 11, at Douai; Contrexeville Mineral Company, Dec. 14, at Paris; and Imphy and St. Seurin Steelworks Company, Dec. 20, at Paris.

The report presented at the annual meeting just held by the French Naval and Railway Blast-Furnaces, Forges, and Steelworks Company (MM. Petin, Gaudet, and Co.) was a document of considerable interest. The directors of the company appear to fully appreciate the necessity of making improvements and supplying the works with new tools, in order to struggle on equal terms against their powerful competitors in England, France, and Belgium for great iron contracts. The company works, it should be noted, mineral-bearings in Sardinia, as well as mines, blast-furnaces, forges, and steelworks in France. It has acquired a considerable importance, and is well calculated to facilitate a study of the advantages and inconveniences attending great metallurgical enterprises. The total sales effected by the company last year amounted to 1,374,178*l.*, showing an advance of 46,559*l.* as compared with the preceding exercise. Some progress was made in 1866-7 in the redemption of capital, but a very considerable sum was expended for new works, tools, &c. The rough profits realised in 1866-7 were 145,799*l.*, as compared with 177,684*l.* in 1865-6, in which exercise the profits were some 32,000*l.* below those of 1864-5. After making various deductions for redemptions, &c., the sum available for distribution among the shareholders was 129,600*l.*, or 2*l.* 8*s.* per share. It thus appears that the company maintains its position, and even progresses, as regards its sales, but that it has been losing ground during the last two years in respect to the profits realised. The management assigns three causes for the diminution in the profits of 1866-7. The first and most important of these causes cannot be said to be accidental; it is the fall in the price of the majority of metallurgical products, with respect to which the directors observe—"Steel rails, plates, and especially one of the articles upon which profits have hitherto been highest—armour-plates for ships—have experienced a fall. Will this fall disappear? We dare not hope that it will, and we can only seek to fill up the loss arising under this head by a greater extension of our manufacture. It is to this object that we have been applying ourselves." Two other accidental causes which adversely affected the operations of the company in 1866-7 may be summed up in one—the Universal Exhibition, which disturbed the ordinary course of the company's proceedings to some extent, besides involving it in an outlay (an outlay deemed necessary in order to worthily sustain the reputation of the undertaking) of 15,000*l.* These circumstances will cause serious reflections as to the burthens imposed on industrials by great international exhibitions. As regards its steelworks, the company is proceeding vigorously in the policy of re-organisation, traced out for French metallurgical industry by the recent treaties of commerce. At St. Chamond an engine of 300 horse-power has been erected, as well as a great mill for rolling steel rails, and the angle, &c., iron or steel dealt with at the works. A new set of machinery for the manufacture of tyres has also been established, having regard to the development of the steel manufacture. At Assailly entirely new machinery has been equipped for the manufacture of military weapons; in consequence of the "reorganisation" of the "plant" of the French army, the company has been delivering of late 40,000 Chassepot guns and other weapons per month; and the directors observe, with some complacency:—"We have had the satisfaction of being able to meet all orders, and to furnish weapons the quality of which has been everywhere appreciated. It is a manufacture which is only yet commencing, and which promises for several years to yield good results." The management, we may add, has so materially improved the company's resources as regards the production of Bessemer steel that it can now turn out a minimum of 50 tons per day. The company is working in Belgium an important bearing of minerals, and it has imported into France 31,000 tons of superior minerals. Preparatory works in connection with the extraction of coal from mines at Unieux and Fraisse have absorbed a rather considerable amount of capital. The directors complain that the amount of floating capital at their disposal is insufficient, and to remedy this it is proposed to issue obligations to the extent of 160,000*l.* It is clear that a concern like the French Naval and Railway Blast-Furnaces, Forges, and Steelworks Company, which possesses coal mines, forests, ironstone bearings, blast-furnaces, forges, steelworks, &c., must have very large disposable resources at its command.

As regards the Belgian coal trade, we may note that in the Charleroi basin collieries such as Couillet, Chatelineau, Bonne-Espérance, Charbonnages-Réunis, Sacré-Madame, &c., which produce first-rate demi-gras coal, are running off their extraction from day to day, and maintain prices with firmness. The other collieries of the basin which produce the same variety of coal, but of inferior quality, begin to have considerable stocks on hand, notwithstanding an abatement of 5d., and even 10d., per ton. As regards coking coal, prices range at about 12*s.* to 12*s.* 10d. per ton for all-coming qualities. In the basin of the Couchant de Mons deliveries by boat, and even by railway, have slackened; affairs are concluded with difficulty, and stocks continue considerable, notwithstanding the season of the year at which we have arrived. Ordinarily, in the autumn and early winter a contrary state of things prevails, the deliveries being superior to the extraction. As regards deliveries by railway, it may be noted that they present the advantage of always obtaining coal of fresh extraction, since the wagons come to the pit's mouth and receive the extraction of the day, or nearly so. For deliveries of coal of this kind the prices of first quality are pretty well maintained, although for large quantities reductions are made according to the extent of the contracts concluded. As regards inferior qualities of coal, it must be observed that their price has been rather seriously affected. The Vezin-Aulnoye Company has just held a general meeting of its shareholders; the meeting was not, however, of a very satisfactory character, as the results of the exercise of 1866-7 do not enable the directors to distribute any dividend among the shareholders. Contracts have been let during the last few days to meet the requirements of the Belgian State Railways. One lot of 283 tons of Bessemer cast-steel rails was let to the John Cockerill Company, at 12*l.* 11*s.* 6d. per ton. The next lowest tender was presented by the Barrow Hematite Steel Company, which offered to supply the lot at 13*l.* 8*s.* 4d. per ton. Then came the Terre-Noire Forges Company, at 13*l.* 11*s.* 4d. per ton. Mr. J. Robertson, of Hamburg, tendered at 13*l.* 13*s.* 6d. per ton. Messrs. Charles Cammell and Co. (Limited), of Sheffield, represented by MM. Desmed and Co., of Brussels, tendered at 14*l.* 15*s.* 1d. per ton (delivery at Antwerp, the place of delivery also proposed by the Barrow Hematite Steel Company). M. Demoor, of Brussels, representing several other English houses, tendered at 14*l.* 17*s.* per ton. It may be noted that at the commencement of last year a lot of Bessemer steel rails similar to that now adjudicated was let to an English concern at 15*l.* 1*s.* 10d. per ton, or 2*l.* 10*s.* 4d. per ton higher than the price which has now been agreed upon by the John Cockerrill Company. This would seem to show either that the production of Bessemer steel has realised great progress during the past year, or that siderurgical industry is eagerly seeking after contracts; the latter appears to be the most correct view of the case. At the adjudication which has provoked this remark, a contract for 2700 fish-plates, bolts, &c., was let to MM. de Dorlodot Frères, of Acoz, at 7*l.* 3*s.* 3d. per ton. Last year the house of de Dorlodot tendered for a similar lot at 7*l.* 12*s.* 9d. per ton. The situation of the Belgian siderurgical works remains much the same; some orders to meet current requirements come to hand pretty regularly, and keep the works going tolerably well, but no important contracts present themselves. The Monceau-sur-Sambre Company has just put a furnace out of blast. The nail trade has somewbat revived. The Austrian Company for the Fabrication of Chemical and Metallurgical Products will pay, Dec. 15, a dividend for the exercise 1866-7, or 4*l.* per share. The Phœnix Mines and Ironworks Company will pay, Jan. 2, 1868, a dividend for the exercise 1866-7, at the rate of 11 per cent. per annum. Meetings are announced as follows:—Ougree Collieries and Blast-Furnaces Company, Dec. 7, at Brussells; and Esperance Collieries, Blast-Furnaces, and Rolling-Mills Company, Dec. 17, at Liége.

The foreign metal markets present little change. Copper remains stationary, with little activity in the demand; the improvement indicated of late is sustained with difficulty, and on some markets a certain feebleness has appeared, provoked by an absence of affairs. The tin markets have been well supported; at Amsterdam and Rotterdam there has even been an upward movement, in consequence of which Banca has been carried to 54 fls., and Billiton to 53 fls.; this advance is due to some important purchases which have been effected during the last few days. The demand for lead has remained inactive, although no important change has been noted in the tone of the article. The Breslau and Hamburg zinc markets have presented scarcely any modification.

THE NICARAGUA TRANSIT ROUTE.

At a crowded and distinguished meeting of the Royal Geographical Society, on Monday evening, Sir RODERICK IMPEY MURCHISON, Bart. (President), in the chair—present, Earl GRANVILLE, Viscount MILTON, M.P., Viscount STRANGFORD, Sir GEO. POLLOCK, Gen. LEFROY, Right Hon. Sir J. PAKINGTON, Admiral COLLINSON, the hydrographer of the Admiralty, Capt. S. OSBORN, Mr. CRAWFORD, the Astronomer Royal, Capt. A. YOUNG, besides a great number of leading gentlemen and others—a most interesting and valuable account of recent explorations in Nicaragua, carried out with a view to open up an inter-oceanic transit through that country, was given by Mr. JOHN COLLINSON, C.E., F.R.S., who had just returned from the triumphant execution of the work, having completed the only spirit level survey ever made across Central America, with the exception of that of the Panama Railway.

The PRESIDENT, in introducing Mr. COLLINSON, called attention to the fact that very many efforts had been made to penetrate across the primeval forest which characterises the various narrowings of the great Isthmus of Central America, but from the paper which would be read that evening they would see that this effort differed materially from all others, inasmuch as it was eminently successful, and he could speak of it as unexampled for hardships overcome, and for the success it had attained. Mr. COLLINSON, on rising, was received with applause. He then read a highly instructive and exhaustive account of his expedition, and was listened to with marked attention throughout. The following is an abstract:—

The paper, entitled "Explorations in Central America," contains a part of the history of a grand enterprise, inaugurated in the year 1860 by Captain BEDFORD PIM, with the view to establish a healthy, economical, and safe transit across the isthmus of the New World. One route already exists in working order—the Panama Railway—but from its inefficiency to meet the requirements of the rapidly-increasing isthmian traffic, from the insecurity of its terminal ports, from the deadly climate of the country it traverses, and from the exorbitant charges of its managers, the want of a competing line has been long felt as a growing necessity. Many routes have been proposed, both for canals and railways, but all projects for the former have been found too costly to offer a chance of fair remuneration to investors. As regards the latter, many have been proposed, and are even now proposed, but from certain physical features of the isthmus the route projected by Capt. PIM across Nicaragua has stood the test of practical examination in a more satisfactory manner than any of the others. On the Caribbean Sea its proposed terminal port is a bay opening to the south, situated under the lee of Monkey Point and two small islands. It is about four miles across, with an average depth of 3½ fathoms. On the Pacific the option of two ports exists—Realejo, too well and favourably known to require comment on, and a snug though small harbour, San Juan del Sur. In the intervening tract of country lie the two great lakes of Nicaragua and Managua, which have covered up and obliterated all except the highest peaks on the central line of the grand range of the Cordilleras, leaving two subsidiary ranges of low altitude on either side, one dividing the water-shed of the Caribbean Sea and the lakes, the other that of the lakes and the Pacific. The tract of country lying between the latter, much of it cultivated and thickly settled, has been repeatedly examined and surveyed for canal and railway purposes, and reported favourably upon for the latter; but the other tract, lying between Lake Nicaragua and the Caribbean Sea, uninhabited and covered by dense primeval forests and jungle, had never been explored, even partially, until 1863. In that year he went out with Capt. PIM and surveyed about 30 miles from Monkey Point inland; another party at the same time attempted the remaining section to the lake, but after bravely struggling for some months had to succumb without attaining their object. In 1865 another attempt was made on this *terra incognita* by a party commanded by an American backwoodsman, who had distinguished himself in the defeat of WALKER, but he likewise failed. In January of this year, at the instance of certain American capitalists (among others Mr. WEBB, the builder of the Dunderberg) interested in Capt. PIM's project, he was induced to undertake the survey of this section, so as to complete the proof, if possible, of the practicability of the entire route; and on Feb. 25 he commenced operations from the lake end, with two Englishmen, and an average of a dozen natives as assistants. His previous experience had enabled him to draw deductions as to the topography of the country, which he found invaluable as guides by which to select the best route. On the one side an important river, the Rama, though with many turnings, seemed to run a pretty nearly east course, and emptied itself into the ocean about 11 miles south of Monkey Point. Almost on the same parallel another river, the Tule, emptied itself into the lake, and evidently drew its life from the dividing ridge, where the true summit level must exist. He, therefore, worked as closely as he could up the valley of one river and down that of the other; and, though in this preliminary exploration he was only able to go blindly ahead, without much choice of track, he succeeded in crossing the summit level at so low an altitude as 619 ft. above, and at a distance of 31¾ miles from the lake. The gradients laid down from point to point are very good, the worst being for a short distance 1 in 80; and he is confident that these can be preserved without heavy earthworks. The rock, wherever apparent, is always volcanic, basalt, porphyry, and tufa; and this rock, except on the tops of the hills, is covered with a yellowish earth, sometimes friable, and sometimes taking the consistency of clay, and in the deeper valleys forming a soft conglomerate, with large masses of flint embedded. This yellow subsoil, formed by the degradation of the rock, is covered in its turn by a rich loam formed of roots and decayed vegetable matter, and well watered by tropical showers, is astonishingly fertile. On June 3 he succeeded in effecting a junction with his old work at a distance of 61½ miles from the lake, and thus completing the survey, establishing durable bench marks, and carrying levels from lake to ocean. The results have proved that the country admits of an economical line being constructed, and a further careful examination, with more time and means at disposal, will, doubtless, reveal opportunities of effecting great improvements on the present one as laid out. The conclusion of the paper, which occupied forty minutes in reading, was much applauded.

The PRESIDENT then rose, and said that he was much pleased to find such a spontaneous vote of thanks accorded to the author of the paper. He then called on Captain BEDFORD PIM, whom he complimented for the sagacity he had shown in the selection of his associates; more especially he alluded to the names of Mr. COLLINSON and Lieutenant OLIVER, R.A.

Captain BEDFORD PIM, R.N., said that no one could estimate the hardship encountered by Mr. COLLINSON; and had it not been for him, so ably seconded by Lieutenant OLIVER, R.A., both of whom he spoke of in the warmest terms, he would for the third time have been disappointed in seeing the *terra incognita* opened up. But there was one point he wished specially to impress on the audience, and that was, that this is the only survey, with the exception of that of the Panama Railway, which has been made with the spirit-level.

Capt. M. F. MAURY, D.C.L., after expatiating on the hydrography of Central America at length, and in a very interesting manner, said that at last, through this expedition, light had been thrown across the Isthmus.

Dr. BERTHOLD SEEMANN, F.L.S., said that from his many journeys in Nicaragua, he was able to confirm all that had fallen from Mr. COLLINSON, especially in reference to the climate; and as feeders to the railway, he would particularly draw attention to the great mining interest which was being developed in that country, and which he had lately made his speciality, under the auspices of Captain BEDFORD PIM.

Sir EDWARD BELCHER, K.C.B., said that much as he recognised the authenticity and value of the results attained, yet he could not agree in the opinion of those who had just spoken, as he did not believe that Nicaragua was the pest point for a transit across; the climate of the country was very bad, the insects unbearable, and, in fact, he esteemed it as the vilest part of the whole American continent. The ports also he did not consider sufficiently good for such an important business; on the Western Coast, more especially, the gales were so frequent and severe that no safety could be obtained for shipping.

Mr. JOHN H. MURCHISON, F.R.G.S., in an eloquent address, spoke forcibly in favour of the proposed route. He said that the subject before the society that evening was a most important one, both to this country and the world at large. The enormous increase in trade which had taken place in the last 20 years made it absolutely necessary that further facilities should be provided for communication between the Atlantic and Pacific. A strong presumptive fact in favour of the Nicaragua route was that it had already been in operation under great disadvantages, and had even successfully competed with the Panama line in the carrying of passengers. Mr. COLLINSON had alluded to the efficiency and safety of the harbour at Monkey Point. In confirmation of this, he might mention that about two years ago the United States Government had sent a party of engineers from their Coast Survey Department to survey the Atlantic Coast of Central America. The result was a report, in which it was announced that the harbour at Greytown was no longer practicable, and that the harbour at Monkey Point was an excellent one, and afforded the best and cheapest opportunity on the coast to make one. It was also most important to notice that the climate of Nicaragua was far superior to that of Panama, while the former also possessed a considerable population, and great natural resources. Admiral BELCHER had spoken in favour of the Honduras route, but he could inform the gallant admiral that the Nicaragua route was shorter than either the Panama or the Honduras. He would state the distances in figures, which he had procured on good authority, and had been ascertained with care. From Liverpool to San Francisco *via* Nicaragua was 7066 miles; *via* Honduras, 7320 miles; *via* Panama, 8422 miles. From New York to San Francisco, *via* Nicaragua was 4300 miles; *via* Honduras, 4350 miles; *via* Panama, 5200 miles. It would seem, then, that the Nicaragua route was the shortest.

Other gentlemen spoke, among them Admiral OMMANEY and Capt. PEACOCK, R.N., corroborating Mr. COLLINSON'S views.

GEOLOGICAL SOCIETY OF LONDON.—Nov. 20: Warington W. Smyth, M.A., F.R.S. (President) in the chair. Sir George William Denys, Bart., Easton Neston, Northamptonshire, and Septimus P. Moore, LL.B., St. John's Parkvillas, Haverstock-hill, N.W., were elected Fellows. The following communications were read:—1. "On the Glacial and Postglacial Structure of Lincolnshire and South-East Yorkshire," by S. V. Wood, jun., F.G.S., and the Rev. J. L. Rome, F.G.S.—2. "On supposed Glacial markings in the Valley of the Exe, North Devon," by N. Whitley.—3. "On Disturbance of the Level of the Land near Youghal, in the South of Ireland," by A. B. Wynne, F.G.S.

On Wednesday, the following papers will be read:—1. "The Graptolites of the Skiddaw Series," by Dr. H. A. Nicholson, F.G.S.—2. "The Fossil Corals of the West Indies," Part IV., by Dr. P. Martin Duncan, Sec. G.S.

INSTITUTION OF CIVIL ENGINEERS.—At the meeting of members on Tuesday, (Mr. C. H. Gregory, Vice President, in the chair), it was announced that the council, acting under the provisions of section IV. of the Bye-Laws, had admitted as *Students* of the Institution—John Simeon Bergheim; Edward P. Brown; W. C. Burder; C. Clowes; J. T. Denniston; The Hon. Alan de Tatton Egerton; T. C. Ellis; T. J. Ellis; D. Gravell; J. W. D. Harrison; F. Livesey; A. R. Lungley; W. G. Moore; A. Neame; T. F. Parkes; H. D. Pearsall; The Hon. P. J. Stanhope; C. E. Trotter; A. J. Waring; and C. S. Williams.

SOCIETY OF ENGINEERS.—On Monday evening, the adjourned discussion on the paper read on Nov. 18, "On the Connection between the shape of heavy Guns and their Durability," by Arthur Rigg, jun., C.E., will be resumed.

Meetings of Mining Companies.

SOUTH DARREN MINING COMPANY.

A half-yearly general meeting of shareholders was held at the offices, Austinfriars, on Wednesday,—Mr. WHITE in the chair.

Mr. J. H. MURCHISON (managing director) read the notice convening the meeting.

A statement of accounts from May to December was submitted, which showed a balance of assets over liabilities of 794*l.*, after the payment of two dividends of 1*s.* 6d. per share each. The balance carried forward at the last meeting was 665*l.* 6*s.* 11d.

The report of the agent's was read, as follows:—

Nov. 22.—In the report read at the general meeting, in May last, the returns for the succeeding six months were estimated at 550*l.* per month; this amount, we are glad to be able to state, has been exceeded, notwithstanding a delay of a month, from the falling in of some old workings and the partial filling up of the drawing shaft, and without lessening the reserves of ore ground; the ore laid open by the extension of the levels being more than has been stoped and sold. The 70 west has been extended 7 fms., and will be driven as speedily as possible, to get under the ore ground laid open in the 60 and 50; the end is poor now, but an improvement is expected in about 5 fms. The 60 west has been driven 11 fms., in a lode 3 ft. wide, and worth for lead and copper ores 20*l.* per fathom, proving that the lode as seen in the 50 continues good in depth, and that our previous anticipations were correct. The disordered ground in the 50, alluded to in the last report, has been passed through, and for the last 10 fms. this level has been driven on a lode worth from 13*l.* to 18*l.* per fm. The lode in the 30 west appears to be split up into branches, and cross-cuts are being driven to prove which is the main part. The shallow level cast has not yet reached the cross-course, and until that has been passed through no improvement in the lode is expected. The lode is 1 ft. wide, and contains spots of lead and copper ores, but not to value. The cross-course is now about 4 fms. in advance of the end. We estimate that the amount of the returns for the next six months will exceed the costs by 200*l.* per month.—T. PAUL, J. BOUNDY.

The CHAIRMAN moved that the report and balance-sheet be received and adopted, and stated that, although the progress at the mine was not rapid, it was satisfactory.

Mr. THEODORE PAUL explained that in the report submitted to the last meeting it was stated that the 50 west was in disordered ground, but now that level had not only gone through that disordered ground, but was being driven upon a lode worth from 13*l.* to 18*l.* per fm., and had been of that value for 10 fms.; and as to the 60 west, the last report stated that there had been laid open a valuable piece of ground, averaging in value from 10*l.* to 12*l.* per fm., and improving as it was being driven, the lode in the end being worth 15*l.* per fm. In advance of this end the lode in the bottom of the level above is valued at from 20*l.* to 25*l.* per fm. It had been seen by the report just submitted that their anticipations had been more than realised. It was estimated at the last meeting that the monthly profits would be 200*l.*, whereas the amount realised had been 215*l.*

Mr. MURCHISON stated that the accounts submitted to the meeting included the cost up to the end of September. The October cost was not due till Saturday, against which there was ore sampled of the estimated value of 500*l.*, the cost being 418*l.*, so that, including the October cost, and deducting the two dividends paid since May, there was a balance of assets over liabilities of 87*6l.*

Mr. LANE, who considered the report, as well as the financial position of the company, to be most satisfactory, asked if there was any estimate as to the value of the reserves of ore in the mine?——Mr. PAUL estimated the value of the ore laid open to be something like 12,000*l.* He explained that, notwithstanding the necessary hindrance and additional expense in connection with the running together of the old shaft, the returns had been kept up, and the level was filled up with good ore stuff.

Mr. LANE asked Mr. Paul if he saw his way clear to keep up the present dividends?——Mr. PAUL saw no reason to doubt it, for the reserves were increasing, and the mine throughout was improving. The average price of the ore ought to be 20*l.* per ton—that is, if the metal market were in a satisfactory state.

Mr. MURCHISON mentioned that, on the present market value of the shares, the rate of dividends was 24 per cent.

Mr. PAUL, in reply to a question, stated that the reaching of the cross-course—which he computed could be done in about two months—was a point of considerable importance. He further stated that Captain Boundy was certainly not in favour of steam-power, as the operations would not be retarded by frost more than two months; the average returns could be made up by May.

The CHAIRMAN considered the explanations and report were most encouraging. Every point in the mine had improved, and there was every prospect that another dividend, of an equal amount to the last, would be declared in January.

Mr. PAUL explained that the number of men on tutwork, employed in driving

and sinking was equal to those stoping—so that the mine was being fairly and effectively opened, and they were not taking away more ground than was being discovered—indeed, the resources were being increased.

The motion adopting the report and accounts was put and carried unanimously.

Upon the proposition of Mr. LANE, seconded by Mr. LAW, a cordial vote of thanks was passed to Mr. Theodore Paul and Capt. Boundy for the satisfactory and successful manner in which they conduct the operations at the mine.

Mr. PAUL appropriately acknowledged the vote, and stated that it was exceedingly gratifying to find that their services were appreciated, and that their anticipations have been fully borne out by results. He assured the shareholders they might always depend upon all that was put forth in the reports.

Mr. LAW said that his experience upon the reports of their agents had been that results always exceeded the promises.

Mr. PAUL said that as long as the present management was continued the present system would not be altered—that ore would not be taken away unfairly, but that ground would be opened out at least in the same proportion as the quantity of ore returned.

A vote of thanks to the Chairman and directors terminated the proceedings.

BRADDA (ISLE OF MAN) MINING COMPANY.

The annual general meeting of shareholders was held on Monday, Nov. 18, at the Royal Hotel, Douglas,

Mr. G. W. DUMBELL in the chair.

The notice convening the meeting and the directors' and manager's reports were read. The directors said—

"We have great satisfaction in meeting the shareholders of the Bradda Mine, feeling quite sure that the agent's report of the works during the last half-year, and the favourable results produced thereby, more than fully realise the most sanguine hopes entertained by any director or shareholder in the company, for whilst the directors have felt very confident of the valuable discoveries likely to be made at Bradda, they were not prepared to find so considerable an improvement within the short period of the first year and a half of the company. The agent's report will more fully explain the working of the company, and will be read with much interest. During the past year the directors have required their agent to prosecute the work with all the energy that could be employed, and with all the force of hands that could be effectually brought to bear; and it is their determination to continue this course, with the full expectation of making the mine dividend-paying within a moderate period of time."

The accounts and reports were adopted, and on the meeting proceeding to the election of directors, Mr. William Tuxford and Mr. J. D. Lewis retired by the vote of the shareholders; but Mr. Lewis was re-elected, and Mr. L. W. Adamson elected in the place of Mr. Tuxford.—Mr. James Haining was re-elected auditor.

The CHAIRMAN, drawing attention to that part of the manager's report stating that three samples of copper ore had been sent away to be assayed, said that the result had just been received, and was as follows:—No. 1, 37 per cent. of copper; No. 2, 29 per cent.; No. 3 (gossan), 3⅞ per cent.; and No. 4, 8¾ per cent. of copper, and 6 ozs. of silver.

Several of the shareholders expressed themselves pleased with the prospects of the company, and said that they felt themselves satisfied that the mine would soon be placed on the list of those paying dividends.

The CHAIRMAN, again referring to the manager's report, said that when the manager estimated that the raisings would pay the "labour cost of the mine," it must be understood that this would not include the general expenditure of the mine, but simply the labour cost alone. The directors were determined to lose no time in providing the mine with all necessary supplies. The balance to the credit of the company on Aug. 31 being nearly spent, it would be requisite to make another call shortly.

The CHAIRMAN, in reply to a shareholder, said that there was no fear whatever but that the large amount of unpaid instalments would be paid, and that with interest at the rate of 5 per cent. The directors, feeling satisfied that the money was perfectly safe, preferred leaving it out when they were getting a much higher rate of interest for it than was allowed by the Bank.

The meeting having expressed themselves satisfied with this explanation, and with the conduct of the directors throughout, the proceedings closed with the usual complimentary votes.

EAST WHEAL ROSE CONSOLS LEAD MINING COMPANY.

The first annual meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Saturday,

Capt. HANDLEY in the chair.

The MANAGING DIRECTOR read the notice convening the meeting. The directors' report (which appeared in last week's Journal) was taken as read.

The CHAIRMAN said that it afforded him much pleasure to meet his fellow-shareholders upon the present occasion, although so shortly after the formation of the company there was not much to be added to the facts already communicated in the report, which had been in the hands of the shareholders for some time past. During the first year's operations but little could be done beyond that preliminary work necessary for the future effective development of the property; but that work, so far as it had progressed, had been well and economically done; to that fact he could bear his own personal testimony, having visited the mine a few weeks since, accompanied by Captain Evans, the present manager of a portion of Old East Wheal Rose, the shares of which at one time, with 50*l.* paid, advanced in market value to 1800*l.* This practical authority testified to the remarkably efficient way in which the whole of the operations had been carried out, which reflected the greatest credit upon their manager. The shareholders had been made aware by the reports of their manager that the shaft was being sunk upon the north lode, and it afforded him much pleasure to be in a position to state that as the explorations were deepened the general stratification of the ground gradually became of that "kindly" character, which the practical miner of that now fashionable and productive district always regarded as the most certain indication of a profitable mine being opened up. But, apart from this fact, he had the satisfaction of informing the shareholders that during some recent costeaning operations a south lode of considerable promise had been discovered, from which specimens had been forwarded to the offices of the company for the inspection of shareholders. In addition, there were several other points of material importance, the development of which could not fail to open out other sources of wealth, but to which he would now only further refer by stating—and in doing so he was not merely giving his own opinion, but that of the leading mining authorities of the district—that the shareholders possessed in East Wheal Rose Consols one of the most promising young mines in either the East Wheal Rose or Chiverton district. He would not detain the time of the meeting by detailing how some of the richest mines in the county of Cornwall, and more particularly in the district in which their own property was situated, commenced operations with very far less prospects of success than those now presented at East Wheal Rose Consols, and yet after two or three years energetic development had been the means of establishing the fortunes of those now known as county families; nor would he stay to recount the fact that some short period since the properties now called the West Chiverton and Chiverton Mine were purchased for a comparatively small sum, and that shortly afterwards a skilful development of the latter opened up a lead mine, second neither in present nor prospective value to any in Cornwall, paying to its shareholders quarterly dividends at the rate of something like 70 per cent. per annum upon the paid-up capital, while the mine itself is increasing in extent and productiveness as its development was extended. All he need do would be to congratulate the shareholders in East Wheal Rose Consols that they had a property of such admitted value in such a proved productive locality. (Hear, hear.) There could be very little doubt that if proper skill, economy, and energy continued to be exercised, East Wheal Rose Consols would at no distant date successfully vie with some of the richest neighbours. (Hear, hear.) He moved that the report and balance-sheet be received and adopted.

Mr. ROSS, in seconding the proposition, stated that he accompanied their worthy Chairman during his visit to the mine, and he had much pleasure in bearing testimony to all that had been stated as to its position and prospects, no less than to the admirable way in which the whole of the details had been carried out. During their visit they had great advantage of the practical opinions of Capt. Hancock, the manager of the North Chiverton Mine, and also (as the Chairman had said) of Capt. Evans, of Rose and Chiverton United, both of whom expressed an opinion that a great deal of capital must have been expended to have done so much work and so well; and when he told them the amount actually expended, they were both perfectly surprised. As to the mine itself, the fact was that its intrinsic merits were as yet but imperfectly known, and simply because it had not been sufficiently developed. Their motto must be—"Sink your shaft," for it was only by such means that the richest mines had been brought into a condition of remunerative productiveness. His experience—which now extended over many years—had taught him that the so-called failure of mines was in nine cases out of ten attributable to a frittering away of capital in what he called "scratching" operations, for they certainly were not entitled to be designated mining. Suppose that West Chiverton had not practically adopted this motto, but had expended its capital in scratching about in superficial tutwork operations, what would have been the result? Why, necessarily, that which was unhappily too common. West Chiverton did not begin to be productive until the shaft had been sunk to a depth of 70 fms.; but in East Wheal Rose Consols he hoped and believed they would have some profitable sales of ore long before that depth was reached, the character of the ground and the ore-bearing strata partaking more of the nature of that in Old East Wheal Rose, the productive levels in which were much nearer the surface. As to the indications of success, all who had seen the mine agreed that they were extraordinary and exceptional, and of such a character that could not fail to lead to a most profitable lode. Those acquainted with such matters would better understand what he meant if he stated that the ground was composed of a fine blue flookan, which was simply a decomposed clay-slate. As to the south lode that, judging from the specimens he had seen and examined, was all that could be desired, containing every element deemed to be essential to the formation of a large deposit of ore. He considered there was reason to believe that at a depth of something like 30 fms. from surface they would have a lode worth from 1 to 2 tons of ore per fathom.

A SHAREHOLDER asked upon which lode they were sinking.—Mr. ROSS replied that they were at present sinking upon the north lode, and that the south lode was recently discovered by costeaning.

A SHAREHOLDER asked if any known lode had been intersected?—Mr. ROSS stated for the first 50 fms. they had driven through a decomposed country, but more than sufficient to justify a continuance of the driving, which was proved by the results, for a lode of upwards of 7 ft. wide was cut, and of a most satisfactory character. He and his colleagues showed their faith by the large interest they held; they fully believed that by a vigorous development East Wheal Rose Consols would soon become a permanently dividend-paying mine. (Hear).

Capt. SIMMONDS, as the largest shareholder, and one who had known the property for many years, bore testimony to the favourable opinion entertained of their property in the district. Happening to be in the locality during the summer upon a visit to his private property, he asked an old servant, who was employed as one of the miners at West Chiverton, to go over and examine East Wheal Rose Consols, and give his opinion upon it. The opinion he expressed was that he believed it would prove to be a wonderful mine, for the indications were extraordinary. He attached considerable value to that opinion, because it was perfectly disinterested, and from one who possessed great practical knowledge of the district. He (Capt. Simmonds) was accompanied upon his visit to the mine by some of the largest shareholders in the different leading mines, and all expressed the same opinion—that they had never seen such wonderful indications. The property was situated in the heart of the mining country, not far from Old East Wheal Rose, and in the centre of the celebrated lead district of Cornwall. Although he had always heard the property very well spoken of, and had himself entertained favourable opinions with regard to it, he was bound to confess that he was now more than ever convinced that upon adequate development East Wheal Rose Consols would open out a valuable property, for he attached the greatest importance to and placed the greatest reliance in the opinion of the miner to whom he had referred.

Mr. HIBBLE considered the information that had been communicated was most satisfactory; and the shareholders would but be promoting their own interests in continuing to support the directors in their present judgmatic policy.

Mr. ROSS, in reply to a question, stated that there were 1306 unallotted shares. His own opinion was that the smaller the number of shares into which a mine was divided the better was it for all purposes, and certainly when dividends were being realised the larger would be the dividend per share. As it seemed probable that the present subscribed capital would be sufficient to place the mine in a profitable position, he would suggest the desirability of cancelling the unallotted shares—it, of course, remained for the solicitor to say whether that could be legally done.—Mr. PHILLIPS (the solicitor) did not consider they were empowered to reduce the capital, at least without the sanction of the general body of shareholders. The directors, however, might hesitate to allot those shares, but nothing could be done at this meeting. Special notice must be given.

The CHAIRMAN said the question had been mooted because he believed some of the largest shareholders were anxious to increase their interest.—A SHAREHOLDER suggested the matter should be left open, which suggestion was adopted.

The motion adopting the report and balance-sheet was put and carried unanimously. The auditor was unanimously re-appointed.

Capt. SIMMONDS moved that the retiring directors be re-elected. They had conducted the affairs of the company with economy, judgment, and skill, and, guided by the practical experience of their managing director, he had no doubt success would accrue.

The proposition being duly seconded, was put and carried unanimously.

The CHAIRMAN, in acknowledging the vote, expressed his satisfaction that their largest shareholder had been to the mine, and was satisfied with what had been done. All he could say was that it had been the aim of the board to keep down all expenditure to the limits compatible with the efficient development of the mine. As to Capt. Thomas, their agent, although a young man, he seduloustly devoted the whole of his time and abilities to the mine, and the manner in which he had carried out the details proved that he possessed considerable skill and practical experience. As far as the directors were concerned, they would continue to devote their best energies in the service of the company.

A special vote of thanks was passed to the managing director.

Mr. ROSS having appropriately acknowledged the compliment, stated that he had been nearly all his life a miner, and it afforded him pleasure and satisfaction—nay, it was his duty—to use his experience in the promotion of the company's interests. Although experience did not command success, yet he could assure them that no effort on his part would be spared to speedily bring about profitable results. (Hear, hear.)—The meeting then separated.

WESTMINSTER LEAD MINING COMPANY.

A general meeting of shareholders was held at the offices, Old Jewry Chambers, on Thursday,—Mr. THOMAS THOMPSON in the chair.

The notice convening the meeting having been read, a statement of accounts was submitted, which showed a credit balance of 1418*l.*

The report of the directors was submitted, as follows:—

Since the last ordinary general meeting the progress made in attaining the objects for which the company was formed has been highly satisfactory. It will be remembered that at that meeting the question of working the eastern ground was taken into consideration, and as the sett was considered very extensive, and the company had no funds with which to work that portion, it was left to the directors to decide on a plan for raising the necessary capital. As the shareholders are already aware, an extraordinary meeting was called, and authority taken to dispose of this portion of the sett, for the sum of 6000*l.*, to a company to be formed, and called the Ebury Lead Mining Company (Limited). This has been carried out, and part of the purchase money already paid to the Westminster Company, the further balance yet to be received being ample to clear off all the liabilities of that company, and leave a good sum in hand. The accounts for the past twelve months, now presented to the meeting, show a very large outlay, but not more than the mine amply deserved. The works carried out, as those of the shareholders who have visited the mine well know, are of a most extensive character, and reflect great credit on those who have had their superintendence. The mine is now self-supporting, and as a steady increase of 10 tons of ore per month can for the future be depended upon, the company will shortly take its place in the Dividend List. The directors refer with much pleasure to the agents' report, which will no doubt be read by the shareholders with great interest.

The report of the agents was as follows:—

Nov. 27.—We have very great pleasure in handing you our report for the meeting to-morrow, as at no time has the mine looked so well, or that we could see our way more clearly for increased sales of lead ore. In our report of July last we described everything fully relating to the erection of machinery, and we are happy to inform you that the mine is well supplied in this respect, and all its requirements provided for for many years to come, with the exception of occasional lifts of pumps as the mine is being sunk. Thompson's shaft is sinking between two excellent runs of lead ground. It is down 8¾ fms. below the 70 fm. level; the lode in it is from 6 ft. to 8 ft. wide, and worth when last taken down 1½ ton of lead ore per fm. We shall soon drive out on the lode east and west in the 80, and we calculate into rich ore. The ore ground about this shaft is pretty well proved, the eastern for 40 to 50 fms. long being worth on an average about 2 tons per fm., and the western is also about equal in length and value; there is, therefore, scarcely a doubt but that the development of these deposits of ore will ensure speedy and profitable returns to the company. Our last monthly sale of lead was 40 tons, and we propose to sell 50 tons at our next, and to be further increased at the rate of 10 tons per month. The prospects for lead were never better; in fact, the discoveries of ore recently made in the mine are such as to put an increased value on the property, and will ere long, we think, give good profits.—F. EVANS, J. KITTO.

The CHAIRMAN, having moved the adoption of the reports and accounts, stated that, although there appeared to be a large amount of capital expended, yet it was satisfactory to find that by that expenditure the mine had not only been placed in an efficient working condition, but it had been rendered a perfect certainty as regards its successful issue. The property was now in a self-supporting state, the returns for the current month being sufficient—even with the present price of lead—to pay the costs; and (as the report of the agents stated) the returns would be increased at the rate of 10 tons per month, which would, of course, be so much progressive profit. Should that increasing rate of production continue for a few months—and there was certainly nothing to induce the belief that it would not, but, on the contrary, there was every possible reason to suppose it would—then in a few months the originally estimated yield of 150 tons per month would be realised. There could be no question about the result, unless, indeed, they could say that the ore, contrary to precedent, fell off in depth, the result of the development up to the present time being that in each successive level the lode improved in character and extent. Those main lodes, when opened out, had never been known to fail in depth; and their experience in Westminster was precisely analogous to that of the other productive mines in the district. In the neighbourhood there was a mine now working in which, at a depth of 200 fms., there was a run of ore producing 20 tons per fathom; and there was no reason whatever why a similar course of ore should not be found in Westminster. There was another mine, also, in the neighbourhood, which had given in one year as much as 100,000*l.* in dividends. Although he did not look to the realisation of 100,000*l.* in one year from Westminster, yet he felt confident the directors would be in a position at no distant date to recommend the declaration of a good dividend, and that the amount would increase as the development of the property progressed.

Mr. GEORGE BATTERS, in seconding the proposition, considered that the shareholders could not fail to be perfectly satisfied with the position and prospects of their undertaking. There were good grounds for believing that the productiveness of their mine would continuously improve as the explorations were deepened. He had been familiar with that district for a period of nearly 20 years, and he had no hesitation in saying that it was second to none as regarded the remunerative character of its courses of ore in depth. There were mines situated altogether in a different geological position to that of Westminster, from the stratification of which there was no reason to expect the ore would hold in depth; but in Westminster the circumstances were altogether different, the stratum being limestone, in which the mines in that district held down to a depth of hundreds of fathoms. For example, there was the adjoining mine, where the Marquis of Westminster made a profit in one year of 100,000*l.*, and one naturally enquired the reason why it was abandoned? The reason was that they were beaten by the water, and not from the poverty of the mine. It had taken 28 years to drive an adit to unwater this mine, and the Messrs. Taylor had recently resumed the work.

Mr. MUSGRAVE enquired if there was much difficulty in keeping the water in the Westminster Mines?—The CHAIRMAN replied in the negative; and, in reply to a question, stated that there was a prospect that the shareholders would receive during next year good dividends.—Mr. G. BATTERS enquired of Capt. Evans the depth to which the new engine would carry the mine?—Capt. EVANS replied that it was capable of taking the mine to 150 fms. deeper than the present workings.

Capt. JOHN KITTO explained that there was a length of ore ground of over 100 fms., which had gradually improved in depth, and they were confidently looking forward to the next level (the 80) being much better than any previous level.—Mr. BATTERS stated that the district was everything that could be desired for a mine situated as the Westminster for continuous courses of ore in depth, and possessed all the leading characteristcs of the other productive mines, such, for instance, as the Rhosesmor, where they had courses of ore yielding from 8 to 10 tons per fathom; or the Maes-y-Safn, where 40,000*l.* to 50,000*l.* had been spent upon new machinery and plant, and, at a depth of 220 fms. there was a good course of ore, yielding 20 tons per fathom. The Messrs. Taylor resumed the development of this mine after it had been sunk to a considerable depth, and it was now paying at the rate of 4*l.* per share per annum. It was in precisely the same stratification—settled white limestone—as Westminter.

Capt. EVANS explained that Maes-y-Safn was in the same range, in the same character of ground, and at parallel lodes to those in Westminster.

Mr. BATTERS said it was not too much to state that this district was more important than all the others put together, although the mining community appeared to know but little about it, and, therefore, were unaware of the extraordinary productiveness of its mines. The only difficulty in that locality was really a water question. It was not possible to have better mines.

Captain JOHN KITTO, in reply to a question, stated that the engine erected at Westminster was thoroughly effective, and fully equal to all requirements for any reasonable period. He computed that in another couple of months the work in connection with the new shaft would be accomplished, when the whole of the water will be taken from the old shaft. Independently of their present run of ore, he fully expected others eastward.

The CHAIRMAN stated that the sett extended east for at least 150 fathoms, beyond the present working.

Captain EVANS felt confident that other important discoveries would be made going east, which, of course, would be additional to those now being developed. He considered the richest portion of the sett was eastward, in the direction of the mine the property of the Ebury Company.

The CHAIRMAN mentioned that since the last meeting one of the shareholders had sent an independent agent—one very well acquainted with Welsh mining—to inspect the mine, and his report was to the effect that he was perfectly astonished at what he saw. He had not been in the mine for a many years, and he expressed his surprise at the wonderfully improved character of the mine—no less than with the effective character of the machinery erected, stating that it was capable of carrying down the mine to a considerable depth. He further stated that it was the finest mine in that district. When he (the Chairman) mentioned that the agent referred to was not on the best terms with the agent of the mine he need hardly say that the opinion expressed was of the greater value. Referring to the Ebury Mine, another agent stated that it must have been very rich, or the miners could not have earned their salt in the way they worked it.

Captain KITTO stated that there was another mine that at present formed a portion of the Westminster sett, known as the Union, which might with advantage be worked as a separate company; it possessed an independent main lode, which was quite as rich as that in Westminster.

The motion adopting the report and accounts was put and carried unanimously.

A SHAREHOLDER asked Captain Kitto if he had any information to give the shareholders beyond that communicated in the report?—Capt. KITTO replied that when he first saw the mine he formed a very favourable opinion with regard to it, and strongly advised Mr. Thompson to take it up, which he did. He (Capt. Kitto) was very pleased to say he had never regretted giving that advice, for the mine had opened out abundantly satisfactory. The deeper they went the richer the lode became, and he saw no difficulty whatever in increasing the rate of production at the rate of 10 tons per month; they would, of course, lessen their expenses considerably by stopping the old engine, but they would increase, and, probably, very nearly to the same extent, by augmenting the returns; the difference, however, would be productive as against unproductive outlay.

Capt. EVANS, in reply to a question, stated that they were at present employing about 120 hands, and as far as the mine itself was concerned he had no hesitation in saying that it never looked so well as at the present time. The lode was large throughout the mine, and there was no doubt they would be able to do all they had promised, and, perhaps, a little more.

A unanimous vote of thanks was passed to the agents for the satisfactory manner in which they continued to develope the mine.

A vote of thanks to the Chairman and directors terminated the proceedings.

CALDBECK FELLS CONSOLIDATED LEAD AND COPPER MINING COMPANY.

A general meeting of shareholders was held at Carlisle, on Saturday, Sir ROBERT BRISCOE, Bart. (the Chairman of the board of directors), in the chair.

The report of the directors (an abstract of which has already appeared in the Journal) was taken as read.

The CHAIRMAN, in moving its adoption, stated the directors considered that the shareholders had before them practical evidence enabling them fairly and justly to form an opinion of the actual position and prospects of the mine; and, in taking that view, they were convinced that in future the works must be carried on in a manner different from that which appeared to be the impression of the shareholders at the last meeting. The directors had since seen reason for concluding that if the plans suggested by Cornish engineers were carried out the sooner the concern was closed the better. As to "Mexico"—the eastern part of the Roughton Gill Mine—which the Cornish engineers looked upon as the great source of wealth to the shareholders—they had found that part of the property, after twelve months' operations, if possible, in a worse condition than before it was tested. Although in the levels they had met with some little sparkling blue ore, yet considering the matrix in that place, there was nothing to give them any great hope of realising ore there; on the contrary, they met with the very worst symptoms in the opposite direction. In following that intermediate east, the directors recommend that it was desirable it should be driven only 40 to 50 fathoms, so as to cut through the back of a cross vein, in the hope of meeting with some ore, and if they did not then meet with evidences which gave them strong hopes of ore they recommended that all expenditure should cease for the present in that part. He next referred to the western portion of the mine, in which they had ore nearly from grass right away down, and increasing in value and extent as the explorations were deepened. He next referred to the dressing machinery, put up under Cornish advice and direction, stating that not only could the directors say that it did not dress 30 tons per month, but it was of such a character, and did its work in such a way, that the managing captain found he really could not dress ore with it properly, although at a cost of 3*l.* per ton; whereas the old machinery, whether or not it were in an efficient state, was able and, in fact, had dressed as much as 60 tons per month, at an average of a little over 19*s.* per ton. The new machinery had been so altered as to reduce the cost of dressing, and with slight additions they anticipated they would be able to meet the requirements of the case, unless the mineral should turn out more abundant as the mine was increased in depth. The crushing mill would also have to be altered, when they hoped to be able to reduce the crushing of the ore to about the price it stood at formerly. The directors approved as much as anyone that the mine should be proved in depth, otherwise it could never have a chance of being a profitable investment; but, after full experience, they entirely differed from the plans hitherto adopted for proving it. The sinking should be continued on solid ore (at a point which he indicated on the plan), following up the vein, so that any work they did would not only pay its own expense, but yield an overplus. He then called upon the secretary to read the report of Mr. Place, a Yorkshire mining engineer, the agent of the lord of the royalty, who had inspected the mine.

The SECRETARY read the report, which stated that there are two principal veins running nearly parallel, about 10 fms. apart; they carry a strong, rich mineral matrix, varying from 6 to 24 ft. wide, and are intersected by cross veins, at an angle of about 25° east of south and west of north. These cross or oblique veins form valuable tributaries or mineral feeders of the more east and west lodes, and when in conjunction therewith very large deposits of blue and grey lead and copper ores have been found in the western part of the ground. Judging from the extremely favourable indications seen on the surface and in the shallow level, there is a very strong probability that by prosecuting the main levels westward beyond the furthest point of the present workings, there will be a good producing mine as rich as, if not richer than, before. He considers the management of the mine is in competent hands, and if the company would abandon the engine and shaft—persevere with the main forceheads now in progress—and carry out the other suggestions made, he believes that Roughten Gill will be a good producing mine for many years to come, and, with proper economy, profits will be realised.

The CHAIRMAN said that the total cost for the erection of labourers' cottages would be 800*l.*, but that would bring in 72*l.* per year rent, which was a good investment. He then proceeded to state that there were about 100 tons of grey ore, 20 of blue, and 12 tons of copper on the floors—together, 132 tons. Since the accounts were made up, 87 tons of blue and 10 of grey had been sold; and there were 12 tons of copper ready for market. On the mine 30 tons of grey, and 50 tons of blue ore. The accounts showed that 2884*l.* worth of ore had been delivered into market, and cash received for it; as well as 157*l.* for copper. The 87 tons of blue ore and 10 of grey, before referred to, have produced 1254*l.*—Mr. BANKS seconded the motion for the adoption of the report and accounts.

The CHAIRMAN, in reply to a question, stated that, with the assistance of their able secretary, he had endeavoured roughly to separate the items of capital and revenue, and if he had arrived at a correct conclusion the prospects of the mine in future were very satisfactory indeed. They must not take the present expenditure on capital and charge it against this year's yield of ore. As to the management, he was quite satisfied that there was no waste through deficient superintendence.

Capt. MUSE bore his testimony, after much practical experience, to the admirable management of the mine since the appointment of the new board and the manager (Capt. Francis).—The CHAIRMAN, in reply to Mr. CROSTHWAITE, stated that there was no likelihood of another call being made at present.

The report and accounts were adopted unanimously. Sir Robert Briscoe and Mr. Banks were unanimously re-elected directors, and Dr. Tiffin was appointed in the place of Mr. Hardie. Mr. James Irving was appointed auditor.

A vote of thanks to the Chairman concluded the proceedings. Sir ROBERT BRISCOE, in reply, said he had some hope that at the next meeting he might have the pleasure of proposing the declaration of a small dividend.

[For Meetings of other Companies see accompanying Journal.]

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